For example, a host computer located in San Francisco may access a storage system located in Boston (specification, page 8, lines 26-31). This geographic distance may cause latency through the network that may negatively impact the performance of the host computer (specification, page 9, lines 1-2). Moreover, if a number of host computers access logical volumes on the storage system, a high processing load may be placed on the storage system that can negatively impact its performance (specification, page 9, lines 1-2).

Some embodiments of the invention are directed to a novel technique for enabling multiple host computers to share access to at least one volume of storage. In one embodiment, a volume of storage may be exported by a host computer to at least one other host computer to provided shared access to the logical volume (specification, page 9, lines 16-18). In some embodiments, the volume of storage exported by the host computer may be one that is provided to the exporting host by a storage system and may be stored on a non-volatile storage medium (specification, page 9, lines 18-20). In another embodiment, the host computer that receives a logical volume can, in turn, export that logical volume to yet another host computer, such that a hierarchy can develop through which the logical volume is distributed throughout the computer system and made available for shared access by a number of host computers (specification, page 9, lines 20-25).

This technique for sharing access to logical volumes of storage differs from that of a conventional storage system because each host computer that accesses the logical volume can access an associated local copy of the logical volume rather than all host computer needing to access the logical volume from the storage system (specification, page 12, lines 8-12). This reduces the load on the storage system to enable it to achieve improved performance. Furthermore, the distribution of multiple copies of the logical volume throughout the computer system can result in local copies that can be accessed more quickly, without the latencies that may be found in conventional computer systems (specification, page 12, lines 12-16).

The foregoing summary is provided merely for the convenience of the Examiner in appreciating some embodiments described in the Applicants' specification. The summary may not apply to each of the independent claims, and the language of the independent claims may differ in material respects from the summary provided. The Examiner is requested to give careful consideration to the language of each of the independent claims and to address each on its own merits, without relying on the summary provided above. Applicants do not rely on the summary to

distinguish any of the claims of the present application over the prior art, but rather rely only upon the arguments provided below.

Rejections Under 35 U.SC. §102

The Office Action sets forth three separate rejections of claims 1, 2, 4-6, 10-13, 18, 25-26, 30, 35-37, 42, 47-52, 54-55, 58-62, 71-77, 79-82, 84, 85, 88, 93-96, 98-100, 102, 107-111, 113, 115, 120-124, 126-129, 131, 132, 134, 139-143, 145, 146, 148, 153-158, 160, 161, 163, 168, and 169 under 35 U.S.C. §102. Specifically, these claims are rejected under 35 U.S.C. §102(b) as purportedly being unpatentable over Taylor (5,664,170), under 35 U.S.C. §102(b) as purportedly being unpatentable over Von Herzen (5,924,115), and under 35 U.S.C. §102(b) as purportedly being unpatentable over Dunham (6,854,035). Applicant respectfully traverses each of these rejections.

Each independent claim includes a limitation that relates, in one way or another, to the concept of a host computer exporting at least a portion of logical volume to another host computer. The limitation of each independent claim relating to this concept is set forth in Table 1 below. As discussed below in greater detail, none of the relied upon references (Taylor, Von Herzen, and Dunham) discloses or suggests the concept of a host computer exporting a logical volume (or a portion thereof) to another host computer. Thus, each of the independent claims is believed to patentably distinguish over these references. Each of the rejected dependent claims depends from one of these independent claims and is patentable for at least the same reasons as its respective independent claim.

Rejections Under Taylor

Taylor is directed to a distributed network database containing configuration information for a network divided into domains. Taylor discloses that a network database containing configuration information for the network (i.e., information relating to the computers, users, resources, and services available to the network) is distributed across the domains of the network, so that each domain stores the portion of the information that is relevant to the users of that domain (col. 3, lines 48-62).

The Office Action asserts that Taylor discloses a plurality of host computer including a root host computer and at least one child host computer by virtue of the fact the system of Taylor is

organized into a plurality of domains, including a parent domain having one or more child domains. The Office Action further asserts that Taylor discloses exporting a portion of a volume of storage from a parent domain to a child domain at col. 7, lines 60 to col. 8, line 21, asserting, "the system allowing replication where both masters and slave can share access to database information in storage volume."

Applicants respectfully disagree that the cited portion of Taylor discloses exporting a portion of a storage volume from a parent domain to a child domain. Rather, this paragraph discloses that the data stored in a domain may be replicated from a master server to a clone server to improve performance by distributing the access load for acquiring information for a domain from one computer to several computers.

Replicating data from a master server to a clone server is very different from exporting data from a parent domain to a child domain. That is, in Taylor when data from a master server is replicated to a clone server, it is not exported to another domain. Rather, the data of a single domain is stored on several computers. Indeed, at col. 7, lines 58-59, Taylor states, "[i]t may be convenient to have the information of a single domain stored on several computers."

Thus, Taylor does not disclose or suggest exporting data from a parent domain to a child domain. Rather, Taylor discloses storing the data from a single domain on multiple computers.

Rejections Under Von Herzen

Von Herzen is directed to a hierarchical memory architecture for a programmable integrated circuit having an interconnect structure connected in a tree configuration. Von Herzen discloses a memory for use in a programmable gate array that has a plurality of interconnect nodes in a tree configuration that are used to interconnect memory cells (Abstract). The tree structure is traversed from the root node to a memory cell based upon a multi-bit address to access the data stored on a memory cell (Abstract).

Von Herzen is unrelated to sharing access to a logical volume among multiple host computers. That is, the interconnect nodes in the system of Von Herzen do not have any memory, do not store any data, do not store logical volumes, and do not export logical volumes. Rather, in Von Herzen, each interconnect node in the tree receives a multi-bit address word, strips off a bit of

the address word and passes the address word (minus the stripped-off bit) to one of its child interconnected nodes based on the value of the stripped off bit (col. 3, lines 36-39).

Thus, in Von Herzen, an interconnect node does not export a logical volume to another interconnect node.

Rejections Under Dunham

Dunham is directed to management of a storage area network (SAN). The Office Action cites col. 2, line 58 – col. 3, line 41 and col. 4, lines 30-51, as being relevant to the present application. The cited paragraphs do not relate to a host computer exporting a logical volume to another host computer. Rather, these paragraphs describe a management tool for a SAN which includes a plurality of software agents that collect information about devices in the SAN and describe a way in which logical unit numbers (LUNs) may be assigned to devices in a SAN. The cited paragraphs do not relate to host computers sharing access to logical volumes or a host computer exporting a logical volume to another host computer.

Table 1

Claim	Limitation
Claim 1	exporting at least a portion of the volume of storage from the root host computer to the at least one child host computer so that the at least one child host computer and the root host computer share access to the volume of storage
Claim 25	exporting at least a portion of the volume of storage from the root host computer to the at least one child host computer so that the at least one child host computer and the root host computer share access to the volume of storage

Claim 47	exporting at least a first portion of the volume of storage from the root host computer to the at least one child host computer
Claim 71	exporting at least a first portion of the shared volume of storage from the first root host computer to the first group of child host computers
Claim 76	exporting at least a portion of the volume of storage from the first host computer to the at least one second host computer so that the at least one second host computer and the first host computer share access to the volume of storage
Claim 93	exporting at least a portion of the volume of storage from the first host computer to the at least one second host computer so that the at least one second host computer and the first host computer share access to the volume of storage
Claim 107	receiving at least a first portion of the volume of storage at the first host computer from the third host computer which exported the at least a first portion of the volume of storage to the first host computer so that the third host computer and the first host computer share access to the volume of storage

Claim 122	at least one controller, coupled to the at least one port, to export at least a portion of the volume of storage from the first host computer to the at least one second host computer so that the at least one second host computer and the first host computer can share access to the volume of storage
Claim 139	at least one controller, coupled to the at least one port, to export at least a portion of the volume of storage from the first host computer to the at least one second host computer so that the at least one second host computer and the first host computer can share access to the volume of storage
Claim 153	at least one controller, coupled to the at least one port, to receive at least a first portion of the volume of storage from the third host computer which exports the at least a first portion of the volume of storage to the first host computer so that the third host computer and the first host computer can share access to the volume of storage, the at least one controller further adapted to export at least a second portion of the volume of storage from the first host computer to the at least one second host computer so that the at least one second host computer, the third host computer and the first host computer can share access to the volume of storage

As should be clear from the foregoing, the relied upon references do not disclose or suggest the limitation of each independent claim listed in Table 1. Accordingly, it is respectfully requested that the rejections of these claims be withdrawn.

Each of the rejected dependent claims depends from one of these independent claims and is patentable for at least the same reasons as its respective independent claim. Accordingly, it is respectfully requested that the rejections of these dependent claims be withdrawn.

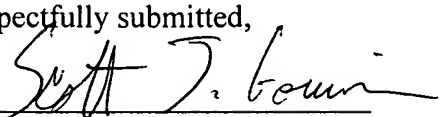
CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Dated: January 10, 2007

Respectfully submitted,

By 

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